

## Book reviews

### **Pesticide remediation in soils and water**

PC Kearney and T Roberts,  
John Wiley and Sons Ltd, Chichester, UK, 1998  
pp XV+381, price UK£85.00  
ISBN 0 471 968056

This is the second (first according to the preface) volume of a new series in Agrochemicals and Plant Protection and tackles the subject of pesticide waste treatment. The first two chapters review the potential for pollution through the pesticide manufacturing and distribution system and the steps that have already been taken to reduce the likelihood of its occurring. Chapters 3 and 4 consider the properties of pesticides and how their fate and behaviour at high concentrations may affect disposal options and the processes of attenuation, familiar to those who have studied pesticide fate following their normal agricultural use. Nine of the next ten chapters each take on individual remediation processes; incineration, thermal desorption, land farming, direct radical oxidation, bioremediation, biostimulation, phytoremediation, and photoremediation while chapter 12 reviews innovative remediation technologies. Each chapter sets out well the basic theory of the process, the extent to which it is developed (generally with case histories) and an indication of the economic viability. The final chapter sets out the US regulatory framework within which remediation must take place and collates some useful information about statutes and competent authorities. This last chapter exemplifies my one real criticism of the book, which is that it is almost entirely focused on US experience and regulations; only in chapter 13 on photoremediation is there any significant reference to European experience. Having said that, the book would be of interest to those who need to get a good overview of the technologies available for pesticide remediation, in particular students on post-graduate courses, recently recruited regulatory staff and researchers who may be entering this field from a background of more classical crop protection/environmental fate of agrochemicals.

RJ Williams

### **Qualitative analysis: A guide to best practice**

WA Hardcastle  
Royal Society of Chemistry, Cambridge, UK, 1998  
viii+23 pp, price US\$9.50  
ISBN: 085404 4620

Dr Hardcastle and his team have produced a timely,

succinct guide to many of the key issues in qualitative analysis. I believe that this booklet will become essential reading to many who are training in analysis and, perhaps, to some who are already experienced practitioners. The 23 page guide is divided into 12 sections, each covering a different topic. Each section is cross-referenced to the appropriate VAM Principle and is written in the economical style necessary for a booklet which is equally at home in the laboratory or the lecture room.

I am pleased to see the emphasis on establishing a dialogue between the laboratory and the customer. Not establishing what is required at the beginning of the analysis is often a source of contention between analyst and customer and often accounts for data being produced which are in excess of what is required in terms of both quantity, necessary specification and cost. The iterative nature of the dialogue is summarised well in the figure given in appendix A.

The guide avoids going into excessive detail on how to avoid the various problems it highlights. This is an excellent approach, both preserving the brevity of the guide and recognising that the solutions to each problem will vary considerably between different types of laboratory, depending on their area of operation.

I am pleased to see this publication and hope to see it in constant use as an *aide memoire* for analysts, business development personnel, customers and laboratory managers.

MF Wilson

### **Pesticide bound residues in soil. Workshop – Senate Commission for the Assessment of Chemicals used in agriculture, Report 2**

Wiley-VCH Verlag GmbH, Weinheim, Germany, 1998  
pp 186, price UK £45.00  
ISBN 3 527 27583 5

The significance of pesticide residues bound to soil (non-extractable residues) is an open question. Are they a time-bomb ticking away which will 'explode' once a certain loading is reached? Or, since 50 years of widespread pesticide use has not apparently given rise to any such identifiable long-term problems, can we merely assume that incorporation of pesticides into soil organic matter so changes them as to render them harmless for all time?

In 1996, these possible concerns and the research priorities therefrom formed the basis of a workshop in Germany, which followed from a status report on 'Ecotoxicology of Pesticides' prepared for the German (DFG) Senate Commission. This workshop, on which this multi-author volume is based, considered all aspects of the definition, behaviour and significance of pesticide residues bound in soil.

Examples are given of the techniques used to investigate the nature of bound residues, which methods include  $^{13}\text{C}$ -labelling with use of nuclear magnetic resonance spectroscopy,  $^{14}\text{C}$ -labelling followed by various chromatographic approaches and immunoassay methods. The nature of the covalent bonds formed between the organic matter fractions (humins, and humic and fulvic acids) and pesticides or their metabolites is considered for several examples, together with ways to stimulate pesticide breakdown and incorporation.

Finally, on the experimental side, several papers address the question of bioavailability of soil-bound residues. Techniques appraised include use of organisms such as earthworms or plants for uptake studies as well as indirect methods such as extraction followed by chemical analysis. It is of interest to note that the amounts of remobilised pesticides or their degradation products were very small in the examples given, and it is reassuring that no deleterious effects from non-extractable pesticide residues in soil are reported. A final chapter summarises the research requirements and some of the approaches and cautions in what can be a difficult area of work.

This book will appeal to the specialist researcher or pesticide regulator, and provides a good background to this topic.

**Richard H Bromilow**

**Metabolic pathways of agrochemicals. Part one – herbicides and plant growth regulators**

Ed-in-chief T Roberts

Royal Society of Chemistry, Cambridge, 1998

price UK £225.00

ISBN 0 854 004 494 9

Bringing together a large amount of previously disparate information, this volume will be welcomed by the herbicide community.

Comprehensively detailing pathways for the environmental and metabolic fate of most currently used products, each entry consists of a standardised, easy-to-read format describing physicochemical properties, chemical degradation and fate in soil, plants and animals. Each entry is accompanied by appropriate metabolic maps and references. A helpful feature is a concise overview of the properties of each chemical family. The book should establish itself as an authoritative reference work in a critically important field, in the years to come.

Some oversights are lack of referencing of mode-of-action statements, and inconsistencies in organism nomenclature – here, a glossary would have been helpful. It was unwise to group certain herbicides, including glyphosate, as ‘organophosphorus com-

pounds’ and I hope these points will be rectified in future editions.

**David J Cole**

**Insecticides of natural origin**

Sukh Dev and Opendar Koul

Harwood Academic Publishers, The Netherlands, 1997

365 pp, price UK£72.00

ISBN 3 7186 5913 1

As someone very interested in new approaches to the description of biologically active compounds from natural origins, I am always keen to read new texts that might offer innovative insights and identify commercially viable opportunities in this exciting area of research. This book has two sections: the first is an introduction, whilst the second is a list of 324 compounds that have been claimed at one time or another to be both natural and insecticidal. The introduction tells the reader that the book presents ‘information in a proper scientific and economic perspective and highlights economically useful leads’. However, the only mention of azadirachtin in the entire book is in the first paragraph; it is not even included in the lists of natural compounds at the end nor is it mentioned in the index (which, incidentally, looks as if it has been added as an afterthought), a very strange situation for a compound that is becoming increasingly lauded for its natural insecticidal effects. If pyrethrum, nicotine and rotenone are excluded, azadirachtin has to be the most widely used natural compound for insect control. I also wonder how useful a table of the 61 plant families that possess species which produce insecticidal compounds is, without some ranking. Are the Poaceae as abundant a producer as the Meliaceae?

In part 2, the list of compounds is arranged by chemistry but separated into higher plants (222), micro-organisms (67), animals (4) and marine organisms (31). The entries contain the structure (where known), the source organism (unclassified beyond genus and species), the test species (with authorities – a significant plus for this) and references. A useful starting point but it could be so much more. The test species and the assays are different, entry to entry, and there is never a standard included so it is not possible to determine how effective the compounds actually are. This is probably not the fault of the authors but is a constant problem with data generated by those working on natural products (it reminds me of an old story of a man who had discovered a product with 10 000 times the wear and 25 000 times the grip but, as his comparator had been a banana, he did not think he had a new car tyre product). However, it would have been helpful to have had some interpretation put on the data to allow the reader to get a feel for the